

**TECHNICAL ANALYSIS
For The Castle Valley Ridge Lease
Star Point Mine
ACT/007/006**

January 6, 1995

ENVIRONMENTAL RESOURCE INFORMATION

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

Permit Area Vegetation Map, 321.100a, delineates the vegetative communities within the Castle Valley Lease Tract. Species list by vegetation type are included in Table 321.100c, page 300-5. In addition to this vegetation information, the mining and reclamation plan includes Color-Infrared photography from the United States Forest Service of the permit area (page 500-29a) as baseline information. The permittee has assisted financially with this study.

Findings:

The vegetation resource information in the plan is acceptable and found to be complete and technically adequate.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322

Minimum Regulatory Requirements:

Analysis:

Map 322.220a, Wildlife Habitat Type, delineating fish and wildlife information, includes the area of the Castle Valley Ridge. The Castle Valley Ridge area is designated as high priority elk winter range. There is only one nest shown in the area, a redtail hawk nest in an aspen tree. Table 322.200a, b, and on pages 300-66 through 300-79 list the mammals, birds, reptiles and amphibians that are

likely to occur within the permit area. Annual raptor surveys have been conducted by the permittee and the Division of Wildlife Resources. This nest activity status is summarized in Table 322.200f, page 300-89.

Hymenoxys helenoides, is considered by the Forest Service to have sensitive status. Forest Service reported a population of H. helenoides in Nuck Woodward Canyon. However, a site survey did not locate this population. No other plant species of special status is known to occur in the Castle Valley Ridge area (page 300-59).

The bald eagle is a rare winter resident of this region. There is a possibility that trees in the area would be utilized for roosting (page 300-89).

Baseline data for macroinvertebrates in Nuck Woodward Creek will be reported in the 1993 and 1994 annual report.

Findings:

The fish and wildlife resource information in the plan is acceptable and found to be complete and technically adequate.

OPERATION PLAN

VEGETATION AND FISH AND WILDLIFE INFORMATION

Regulatory Reference: R645-301-330

Analysis:

No surface disturbance is proposed within the Castle Valley Ridge lease area. Therefore, the only expected impacts to fish, wildlife or vegetation would be from subsidence. The permittee has committed to mitigation or replacement of any material damage caused by subsidence (page 500-29). Although no resource damage is expected from subsidence, monitoring of vegetation, macroinvertebrates and raptors will verify this position. The permittee has committed to annual raptor surveys and to report the results of such surveys (page 300-89). No identified nests are within the subsidence zone of mining activities within the Castle Valley Ridge

lease area.

Nuck Woodward Stream will be monitored for macroinvertebrates according to the schedule shown in Table 322.220b, page 300-101. The intent of the monitoring is to assess if subsidence has increased sediment loading on the stream. No mining is to occur under the stream area itself. The intermittent stream channel of Little Park Canyon will also not be undermined. (page 500-29).

The effects of subsidence on vegetation will be assessed by Color-Infrared photography. The photography is done every five years and reports submitted to the U.S. Forest Service and the Division (page 500-29a).

Findings:

The vegetation and fish and wildlife information in the plan is adequate and found to be complete and technically adequate.

Certifications

Regulatory Reference: R645-301-512

Analysis: The maps which have been revised for the Castle Valley Ridge lease tract are Map 112.500a--Surface Ownership, Map 112.500b--Coal Ownership, Map 222.100a--Permit Area Soils Map, Map 321.100a--Permit Area Vegetation Map, Map 322.220a--Wildlife Habitat Type, Map 521.121f--Subsidence Monitoring Plan, Map 521.121g1--Subsidence Monitoring Plan, Map 624.110Xb--Geologic Cross Section b-b', Map 722.100c--1993 Piezometric Surface, Map 728a--Regional Hydrology, Map 728b--Gentry and Castle Valley Ridge Mine Inflows and Stream Inventory Locations, and Map 722.100c--1993 Piezometric Surface.

Of the maps listed above, only Maps 112.500a, 112.500b, 624.110Xb, 722.100c, 728a, 728b, and 722.100c require certification by a registered professional engineer or land surveyor. These maps have the required certification.

Findings: The application fulfills the requirements of this section.

COMPLIANCE WITH MSHA REGULATIONS AND MSHA APPROVALS

Regulatory Reference: R645-301-513

Analysis: The entire Castle Ridge Valley lease tract will be underground. There are, therefore, no coal processing waste dams and embankments, sedimentation ponds, impoundments, spoil or waste disposal facilities, refuse piles, discharges into underground facilities, surface coal mining activities, or coal mine waste fires associated therewith, which require regulation and approval by MSHA.

The applicant will drill a 10- or 12-inch hole, to be known as the Gentry Mountain Air Shaft, from the surface of Gentry Ridge into the mine workings. The hole will be cased with 8-inch steel pipe, which will extend into a steel access chamber buried beneath the ground. The chamber will be fitted with locking manhole covers at both ends and will be surrounded by a fence.

The purpose of the Gentry Mountain Air Shaft is to provide ventilation and material access to an area of the mine to which miners can retreat in the case of an emergency. In case of an emergency, the hole will then allow communication between the miners and the surface and will provide a conduit through which air, food, water, and medical supplies can reach them.

The Gentry Mountain Air Shaft site will be reached by way of a reclaimed Forest Service road. This road will be rehabilitated for the drilling of the hole and will be reclaimed immediately after completion of the hole and the steel chamber. Thereafter, a 550-foot trail will provide access from an active Forest Service road to the site.

The Gentry Mountain Air Shaft will be reclaimed in accordance with 30 CFR 75.1711. The underground steel chamber will be removed and the hole will be filled from bottom to collar with concrete. The 550-foot access trail will then be ripped, if necessary, and seeded. The site of the shaft will be backfilled, covered with topsoil, reseeded, and surrounded with a fence to protect it from wildlife during re-establishment of vegetation.

Information for this section is found on pages 500-32, 500-32a, 500-37, 500-49, 500-71, 500-72, Figure 526.100a, and Map 521.121h.

Findings: The application fulfills the requirements of this section.

OPERATION PLAN

Regulatory Reference: R645-301-520

GENERAL INFORMATION

Regulatory Reference: R645-301-521

Analysis: The maps which have been revised for the Castle Valley Ridge lease tract are Map 112.500a--Surface Ownership, Map 112.500b--Coal Ownership, Map 222.100a--Permit Area Soils Map, Map 321.100a--Permit Area Vegetation Map, Map 322.220a--Wildlife Habitat Type, Map 521.121f--Subsidence Monitoring Plan, Map 521.121g1--Subsidence Monitoring Plan, Map 624.110Xb--Geologic Cross Section b-b', Map 722.100c--1993 Piezometric Surface, Map 728a--Regional Hydrology, Map 728b--Gentry and Castle Valley Ridge Mine Inflows and Stream Inventory Locations, and Map 722.100c--1993 Piezometric Surface.

These maps have all been revised to show the anticipated mine layout, the surface and subsurface ownership, the surface configuration, the geology, the anticipated surface facilities, and the subsidence monitoring system associated with the new lease tract. As the entire Castle Valley Ridge lease tract is underground, the rest of the mining operation remains as it is represented in the approved plan.

Findings: The application fulfills the requirements of this section.

COAL RECOVERY

Regulatory Reference: R645-301-522

Analysis: The permittee is committed to maximum coal recovery. Mining in the Castle Valley Ridge lease tract will be done mainly by longwall methods, which allow for the highest coal recovery rates of any available technology. Continuous mining

machinery will be used to create permanent pillars beneath Little Park Channel and, of course, to do the entry development work for the longwall panels. Pillars will be recovered in continuous miner sections wherever possible. Using these methods, the permittee expects to reach an overall net coal recovery rate of approximately 75%.

A Resource Recovery and Protection Plan (R2P2) was approved by the BLM in September of 1991 and modified in November of 1992 to allow for increased production. The modified R2P2 allows for a raw production rate of 3 million tons per year through the year 2000, after which the production rate will drop to 700,000 tons per year for the remaining 10 years of anticipated mine life.

Location in Plan: Pages 500-7 through 500-13.

Findings: The application fulfills the requirements of this section.

MINING METHOD(S)

Regulatory Reference: R645-301-523

Analysis: Mining in the Castle Valley Ridge lease tract will be done mainly by longwall methods, which provide the highest coal recovery rates of any available technology. Continuous mining machinery will be used to create permanent pillars beneath Little Park Channel, and, of course, to do the entry development work for the longwall panels.

Location in Plan: Pages 500-8 through 500-14.

Findings: The application fulfills the requirements of this section.

SUBSIDENCE

Regulatory Reference: R645-301-525

Analysis: The permittee has performed a subsidence survey of the surface area, as required by this section. The land is used mainly for cattle grazing and wildlife

habitat, and somewhat less for recreation. There are several natural springs. The only manmade structure in the area which could be adversely affected by subsidence is an unimproved U.S. Forest Service road, and this the permittee has committed to repair in the event that it is damaged by subsidence.

To measure subsidence, the permittee will extend the present network of monitoring points to cover the area of the lease tract. The placement of subsidence monitoring points is shown on Maps 521.121f and 521.121g1. The coal in the lease tract will be cut east to west, figuratively speaking, into two large blocks. The northern block will be crossed from east to west by a line of monitoring points. The southern block will also be crossed from east to west by a line of monitoring points, while another line of monitoring points will extend northward from about the midpoint of the southern edge of the block to join this line near its midpoint. Several lines of monitoring points also extend and will extend east to west from the potential subsidence zone into Nuck Woodward Canyon. All monitoring points will be placed at 200-foot intervals.

The permittee has had concern about the possible deleterious effect of subsidence on Little Park Channel, which crosses the lease tract area in an east-to-west direction, and on Nuck Woodward Canyon, which parallels the western boundary of the area. The permittee is particularly concerned about Nuck Woodward Canyon because a perennial stream flows there.

To prevent damage to Little Park Channel, the permittee will leave a large barrier pillar beneath the channel to prevent subsidence from occurring above the entries which will be located there. This barrier pillar was designed to have a minimum static safety factor of 2.04 using a 26° angle of draw, which is the largest angle of draw encountered during previous mining in this area.

To prevent damage to the perennial stream in Nuck Woodward Canyon, the permittee has designed the placement of mine workings so that subsidence, projected upward using the conservative 26° angle of draw, will fall several hundred feet short of the stream channel. If this precaution proves inadequate and subsidence approaches too near the stream channel, as measured by the movement of the surface monitoring points, mining in a westerly direction will be stopped.

The permittee also commits to the mitigation, in general, of subsidence damage. Where cracks or fissures occur which injure or endanger livestock, the permittee will repair the crack or fissure and reimburse the livestock owner for the lost

livestock. Where groundwater sources are damaged or impaired by subsidence, the permittee will either directly repair and rehabilitate the water source or else develop an alternative water source in the same area. The mitigation of damage to groundwater sources is treated more fully in Section 700 of the plan

Subsidence information is found on pages 500-16 through 500-32, Map 521.121f, and Map 521.121g1.

Findings: The application fulfills the requirements of this section.

MINE FACILITIES

Regulatory Reference: R645-301-526

Analysis: There will be only one surface facility, the Gentry Mountain Air Shaft, above the Castle Valley Ridge lease tract. The applicant will drill a 10- or 12-inch hole from the surface of Gentry Ridge into the mine workings. The hole will be cased with 8-inch steel pipe, which will extend into a steel access chamber buried beneath the ground. The chamber will be fitted with locking manhole covers at both ends and will be surrounded by a fence.

The purpose of the Gentry Mountain Air Shaft is to provide ventilation and material access to an area of the mine to which miners can retreat in the case of an emergency. In case of an emergency, the hole will then allow communication between the miners and the surface and will provide a conduit through which air, food, water, and medical supplies can reach them.

The Gentry Mountain Air Shaft site will be reached by way of a reclaimed Forest Service road. This road will be rehabilitated for the drilling of the hole and will be reclaimed immediately after completion of the hole and the steel chamber. Thereafter, a 550-foot trail will provide access from an active Forest Service road to the site.

Mine facility information for the Castle Valley Ridge Lease Tract is found on pages 500-32, 500-32a, 500-37, 500-49, 500-71, 500-72, Figure 526.100a, and Map 521.121h.

Findings: The application fulfills the requirements of this section.

TRANSPORTATION FACILITIES

Regulatory Reference: R645-301-527

Analysis: The only transportation facility associated with the operation is the access road to the Gentry Mountain Air Shaft site. This road will follow the route of an existing, reclaimed Forest Service road and will be classed as ancillary. It will be a simple, graded dirt road and its construction will involve no cuts or embankments.

The road will be rehabilitated for the drilling of the air shaft and will be reclaimed immediately after completion of the shaft and the steel chamber. Thereafter, a 550-foot trail will provide access from an active Forest Service road to the site, pages 500-37, 500-72, and Map 521.121h.

Findings: The application fulfills the requirements of this section.

HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE

Regulatory Reference: R645-301-528

Analysis: The entire Castle Valley Ridge lease tract operation will be underground. There are, therefore, no disposal facilities for coal, overburden, excess spoil, noncoal mine waste, or coal mine waste associated therewith.

Findings: This section is not applicable to the application.

MANAGEMENT OF MINE OPENINGS

Regulatory Reference: R645-301-529

Analysis: The entire Castle Valley Ridge lease tract operation will be underground. There are, therefore, no breakouts or other mine entries associated therewith.

The Gentry Mountain Air Shaft will be the only opening from the surface above the Castle Valley Ridge lease tract. The applicant will drill a 10- or 12-inch hole from the surface of Gentry Ridge into the mine workings. The hole will be cased with 8-inch steel pipe, which will extend into a steel access chamber buried beneath the ground. The chamber will be fitted with locking manhole covers at both ends and will be surrounded by a fence.

The purpose of the Gentry Mountain Air Shaft is to provide ventilation and material access to an area of the mine to which miners can retreat in the case of an emergency. In case of an emergency, the hole will then allow communication between the miners and the surface and will provide a conduit through which air, food, water, and medical supplies can reach them.

The Gentry Mountain Air Shaft site will be reached by way of a reclaimed Forest Service road. This road will be rehabilitated for the drilling of the hole and will be reclaimed immediately after completion of the hole and the steel chamber. Thereafter, a 550-foot trail will provide access from an active Forest Service road to the site.

The Gentry Mountain Air Shaft will be reclaimed in accordance with 30 CFR 75.1711. The underground steel chamber will be removed and the hole will be filled from bottom to collar with concrete. The 550-foot access trail will then be ripped, if necessary, and seeded. The site of the shaft will be backfilled, covered with topsoil, reseeded, and surrounded with a fence to protect it from wildlife during re-establishment of vegetation.

Information regarding this mine opening is found on pages 500-32, 500-32a, 500-37, 500-49, 500-71, 500-72, Figure 526.100a, and Map 521.121h.

Findings: The application fulfills the requirements of this section.

OPERATIONAL DESIGN CRITERIA AND PLANS

Regulatory Reference: R645-301-530

ROADS

Regulatory Reference: R645-301-534

Analysis: The only road associated with the operation is the access road to the Gentry Mountain Air Shaft site. This road will follow the route of an existing, reclaimed Forest Service road and will be classed as ancillary. It will be a simple, graded dirt road and its construction will involve no cuts or embankments.

The road will be rehabilitated for the drilling of the air shaft and will be reclaimed immediately after completion of the shaft and the steel chamber. Thereafter, a 550-foot trail will provide access from an active Forest Service road to the site (pages 500-37, 500-72, and Map 521.121h).

Findings: The application fulfills the requirements of this section.

RECLAMATION PLAN

Regulatory Reference: R645-301-540

GENERAL

Regulatory Reference: R645-301-541

NARRATIVES, MAPS, AND PLANS

Regulatory Reference: R645-301-542

Analysis: The only surface feature associated with the operation is the Gentry Mountain Air Shaft and its associated access road.

A reclamation timetable is included in the plan as Table 542.100a. The reclamation of the Gentry Mountain Air Shaft and its associated access road has been added to the reclamation timetable as part of the application.

The Gentry Mountain Air Shaft access road will be rehabilitated for the drilling of the air shaft and will be reclaimed immediately after completion of the shaft and the steel access chamber. Thereafter, a 550-foot trail will provide access from an active Forest Service road to the site.

At final reclamation, the Gentry Mountain Air Shaft will be reclaimed in accordance with 30 CFR 75.1711. The underground steel chamber will be removed and the hole will be filled from bottom to collar with concrete. The 550-foot access trail will then be ripped, if necessary, and seeded. The site of the shaft will be backfilled, covered with topsoil, reseeded, and surrounded with a fence to protect it from wildlife during re-establishment of vegetation.

The estimated cost of reclaiming the Gentry Mountain Air Shaft and its associated access road has been included in the overall reclamation cost estimate. The estimated interim reclamation cost for the access road is \$8,725 and the estimated final reclamation cost of the air shaft, the steel access chamber, and the 500-foot access trail is \$2,381 (both costs are 1991 dollars). The addition of these costs to the overall reclamation cost estimate brings that total to \$5.180 million, after escalation over the 5-year permit term to 1996 dollars.

Location in Plan: Pages 500-37, 500-67, 500-69, 500-69a, 500-70, 500-71, 500-72, 800-1, Table 542.100a, Table 542.800a, Table 542.800b, and Map 521.121h.

Findings: The application fulfills the requirements of this section.

Reclamation Design Criteria and Plans

Regulatory Reference: R645-301-550

Casing and Sealing of Underground Openings

Regulatory Reference: R645-301-551

Analysis: The Gentry Mountain Air Shaft is the only underground opening associated with the Castle Valley Ridge lease tract. The Gentry Mountain Air Shaft will be reclaimed in accordance with 30 CFR 75.1711. The underground steel chamber will be removed and the hole will be filled from bottom to collar with concrete. The 550-foot access trail will then be ripped, if necessary, and seeded. The site of the shaft will be backfilled, covered with topsoil, reseeded, and surrounded with a fence to protect it from wildlife during re-establishment of vegetation (see pages 500-32, 500-32a, 500-37, 500-49, 500-71, 500-72, Figure 526.100a, and Map 521.121h).

Findings: The application fulfills the requirements of this section.

GEOLOGIC INFORMATION

CHEMICAL ANALYSES OF STRATA IMMEDIATELY ABOVE & BELOW THE COAL SEAM TO BE MINED

Regulatory Reference: R645-301-624.210 through R645-301-624.330

Analysis:

The permittee's proposal to assess the acid- or toxic forming or alkalinity producing potential for the strata immediately above and below the coal seam within the Castle Valley Ridge Lease Tract may be located on page Confidential 16, Volume VII and reads as follows: ***As mining progresses into the Castle Valley Ridge area, additional roof, floor and split rock samples will be analyzed for the toxic forming/acid forming potential according to the parameters list shown on page Confid 17. Sites for these samples are shown on Map 116. 100c Mine Plan, Wattis Seam, as solid hexagon with no number. Four sample locations are anticipated to characterized the material. This material ultimately becomes coal processing waste deposited in the refuse pile.***

Findings:

The permittee's commitment to chemically analyze the strata immediately above and below the coal seam to be mined is adequate to fulfill the requirements of R645-301-624.220 & 320.

The permittee must submit to the Division upon receipt analytical results from the aforementioned roof, floor and mid seam sample collection.

If determined to be necessary to protect the hydrologic balance or the meet the performance standards of R645-301 and R645-302, the Division may require the collection, analysis and description of geologic information in addition to that required by R645-301-624.

HYDROLOGIC INFORMATION

Regulatory Reference: R645-301-729

Analysis:

The Operator has provided the necessary supporting information to describe the impacts to the hydrologic balance and the potential for impacts outside the permit area. The operator has minimized impacts to the hydrologic balance inside the permit area. Any impacts have been described in the PHC and are currently being monitored and will continue to be monitored for as long as wells are accessible underground. These impacts can be described as a redistribution of ground water from the aquifers above and below the coal seam which is drained into current mine workings and then pumped to abandoned mine workings. This intercepted ground water is pumped across the Bear Canyon Graben to old mine works. The range in-mine pumping rates is from 800 to 1300 gpm at the "Graben Goose" flow meter, a central pumping point. A graph of these flows is found in Exhibit 728a in the PAP

The most significant inflows as of October 1993, within the Gentry Ridge area, are found in the southern extent of the mine workings. As the mine progresses in a southerly direction beneath Gentry Ridge, mining continues to dewater the ground water found in fractures immediately above the mine. No mining-related impacts to the hydrologic balance outside the permit area have been substantiated to date. All potentially-impacted resources have been described, and the sampling schedule is summarized in Table 731.211a and the sampling sites are as shown on Map 722.200a. Water levels and water quality data is included in the Annual Hydrologic

Summary Reports for six surface wells and from seven in-mine wells. A summary of the data used in the analysis of the local water table is shown in Table 728c, pages 700-80 and 700-81 of the PAP.

In regard to the Castle Valley Ridge Lease UTU-64263, two wells were drilled to confirm the location of the water table in relation to the coal seam. Well 92-10-1 was drilled in Little Park Canyon and was completed in the upper 35 feet of the Star Point Sandstone. The water table in this well was found in the Star Point Sandstone well below the Wattis coal seam (mineable coal seam in this lease). The second Well P-91-01-WD was drilled in-mine to a depth of 144 feet below the coal on October 1, 1993 and as of October 19, 1993 this well was found to be dry. This has confirmed the previously collected data for water levels and confirmed the data collected from Well 92-01C-WD. Additionally, as the mine progresses, the permittee has committed to drilling two additional wells into the Star Point Sandstone, in the Castle Valley Ridge Lease, to monitoring long term changes to the hydrologic balance in the permit area, and to verifying water levels to the north. These locations are shown on Map 728b and commitment to drill these are found on page 700-82.39 of the PAP. P92-02-WD and P92-04-WD will be left as in-mine monitoring wells. The surface well, 86-26-6, at the south end of gentry ridge will be used to monitor long term impact following mine closure.

Findings:

The operator has provided an adequate assessment of the Probable Hydrologic Consequences on the quality and quantity of surface and ground water under seasonal flow conditions for the proposed expansion into lease UTU-64263. After an analysis of all baseline hydrologic, geologic, and other information found in the PAP, the division concludes that the proposed coal mining operation and reclamation activities have been designed to prevent material damage to the hydrologic balance outside the permit area.

TECHNICAL ANALYSIS

Plateau Mining Company
Star Point Mine
ACT/007/006, Carbon County, Utah

August 5, 1987

UMC 785.19 Alluvial Valley Floors--(RVS)

Existing Environment and Applicant's Proposal

Unconsolidated streamlaid deposits do not occur within, or in close proximity to, the permit area. Limited Quarternary alluvium (Qal) has been identified along lower Nuck Woodward Canyon and Huntington Creek (Doelling, 1972). Technical staff inspection of the mine site and adjacent area have not identified the existence of flood irrigation (or its historical use) or the capability of stream valleys to be flood irrigated or subirrigated.

Compliance

Sufficient information about alluvial streamlaid deposits and irrigation are available for DOGM to determine as required by UMC 785.19(c)(2) that no alluvial valley floors exist with or in close proximity to the proposed permit area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.11 Signs and Markers--(PGL)

Existing Environment and Applicant's Proposal

This regulation has not been addressed in the PAP.

Compliance

The applicant did not submit information in the PAP.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.11-(1)-(PGL)

The Plateau Mining Company shall submit by October 31, 1987 for inclusion in the PAP, all details about signs and markers as required by this regulation.

UMC 817.13-.15 Casing and Sealing of Underground Openings-(RVS)

Existing Environment and Applicant's Proposal

Boreholes

The applicant has drilled 43 exploration boreholes along Gentry Ridge, Hoag Ridge, and Star Point, within and adjacent to the permit area (Maps 26 and 27). Borehole 86-26-4, located at the southern terminus of Gentry Ridge, has been developed into a ground-water monitoring well. Two additional water wells were drilled in Section 10, T15S, R8E during the late 1970's (PAP, page 783-38).

The applicant states that upon abandonment, all exploration drillholes are to be completely plugged with an approved cement to within three (3) feet of the surface (PAP, page 784-57).

Boreholes to be retained for water monitoring during mine operations will be temporarily sealed with locking caps or by enclosing the well head in a locked manhole (PAP, page 784-58).

Entries

The applicant identifies the development of three portals in Corner Canyon, seven portals at Mud Water Canyon, two portals at Lion Deck, and two portals at Portal Area No. 2. Ten portals have been abandoned and sealed in the No. 1 and No. 2 Mine areas.

Temporarily inactive entries will be fenced or barricaded and posted with warning signs (PAP, page 784-58). Temporary seals will be periodically inspected.

The applicant commits to sealing all mine entries upon completion of mining (PAP, page 784-57). Seals will be constructed of solid concrete blocks in a double wall thickness, located a minimum of 25 feet in by the entryway and recessed 16 inches into the rib and 12 inches into the floor (PAP, page 784-57 and 784-58). A pilaster will be incorporated into the center of the seal. A two-inch drain pipe will be installed from the concrete seal to the entryway (PAP, Figure 20).

Entries will be backfilled to the seal with noncombustible material. The entryway and adjacent highwall (including exposed seam) area will be backfilled with noncombustible material, graded, covered with suitable topsoil material and revegetated (PAP, page 784-58).

Compliance

The applicant's plans for permanently sealing boreholes and entries are designed to prevent access and preclude toxic drainage from entering ground or surface water as required by UMC 817.13 and 817.15.

The applicant has provided adequate plans for temporarily sealing boreholes and entries that are temporarily inactive as required by UMC 817.14.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.22 Topsoil: Removal-(DD)

Existing Environment and Applicant's Proposal

The only areas proposed for topsoil removal are the proposed Gentry Mountain Shaft Site which consists of less than one acre and 14.67 acres on the southwest corner of the refuse expansion area. Profile descriptions for these areas are given in Exhibit 19, page 40-42 for the refuse expansion area, and page 48-50 for the Gentry Mountain area. These descriptions of soils are delineated on maps 39 and 40 respectively. Chemical and physical analysis for these areas are also given in Tables 59 and 65 of the PAP.

Compliance

According to profile description along with the chemical and physical data provided. There are no limiting chemical or physical characteristics within the proposed salvage depths. The soils on the refuse expansion area, to be removed, will be live-hauled to the extent that adequate reclaimed acreage is available. If this material cannot be used in reclamation, then the balance will be hauled to the subsoil stockpile for storage (page 784-27 of the PAP). The soil placed on this stockpile will be stabilized by planting the interim seed mixture. According to the PAP, page 784-28, the Gentry Mountain topsoil plan cannot be presented at this time due to lack of detailed planning. In the event that it becomes

operationally necessary to construct this facility within the permit term of this application, PMC will submit detailed plans outlining the exact location of the shaft facilities, topsoil removal depths, sediment control plans, and detailed reclamation plans (PAP, page 784-28).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.24 Topsoil: Redistribution-(DD)

Existing Environment and Applicant's Proposal

In areas constructed prior to SMCRA, before topsoil was salvaged, the applicant proposes to use existing fill materials as a plant growth medium. Where encountered, buried topsoil will be salvaged and used. Table 61 provides chemical and physical characteristics of the cut and fill material. According to these analyses, the material does not show any major restrictive parameters.

The applicant proposes to reduce potential slippage on the interface between the regraded fill and respread topsoil by scarifying or ripping the soil prior to redistribution of the topsoil. To avoid unnecessary compaction of the respread soil materials, the applicant commits to spreading topsoil when moisture conditions will not increase the likelihood of compaction, and by avoiding trafficking of equipment across the retopsoiled areas. The applicant also proposes to rip areas retopsoiled where trucks, loaders, dozers, or scrapers were used to alleviate compaction where slopes permit.

Six inches of topsoil will be spread over the unit train load out facilities. This includes Sedimentation Pond 8, the silo area, and the southern end of the coal conveyor. This material is presently stored near the coal silo, and is designated on the Disturbed Area Soil Map No. 39 in the PAP. This stockpile contains 1500 cubic yards of material. Soils removed from the northern end of the conveyor are stockpiled adjacent to the existing topsoil stockpile and contain 200 cubic yards of material.

Topsoil will be redistributed at the corner canyon fan site using the topsoil originally removed from the site. This topsoil consists of 200 cubic yards and is stockpiled adjacent to the existing stockpile. The topsoil will be transported back through the mine to the fan site. Five thousand (5,000) cubic yards of subsoil is also being stored in the mine adjacent to the fan site.

This will be redistributed prior to topsoiling. For the .44 acre site these volumes of soil material are equivalent to 7 feet of subsoil and 3 inches of topsoil.

Topsoil was not salvaged when the Lion Deck access road was constructed. The Board granted a variance on August 8, 1979, approving the cut and fill construction method without topsoil salvaging. The applicant has committed to reclaiming the road using the fill material.

The applicant's volumetric estimates indicate that approximately 17 inches of stockpiled soil material is available for redistribution on the coal refuse and lower facilities area. Surveys of the stockpiles indicate there are 192,065 cubic yards of material available.

Compliance

Samples taken in the cut and fill material are located on Map No. 39. Table 61 of the PAP gives chemical and physical parameters of this material. According to the analyses, this material is suitable for use as a plant growth medium.

According to acreage given in bond calculations, Exhibit 36 of the PAP, the unit train loadout facilities to be retopsoiled are equivalent to approximately 7.7 acres, which would require approximately 6,200 cubic yards of material to retopsoil this area at a depth of 6 inches. These figures should be verified so all areas that are to be retopsoiled are accounted for, since the PAP states there are only 1700 cubic yards stockpiled.

Table 60 of the PAP gives chemical data of samples taken from the Lion Deck access road. Samples 79-3820 and 79-3821 are saline based on Ec measurements suggesting this material should not be used for root growth medium. Before reclamation, sampling should be accomplished to verify these values and to locate saline materials so they are not placed in the root zone.

Present study plots on the coal refuse are addressing the amount of topsoil necessary to successfully reclaim the coal refuse and other applicable sites. To date, results of these study plots are promising, and indicate that 17 inches of topsoil soil should be sufficient to reclaim these sites, based on the proposed post mining land use. Acreage figures and locations must be given though, to clarify all areas which will receive 17 inches of topsoil from the 192,065 cubic yards of material stockpiled.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.24-(1)-(DD)

Plateau Mining Company must submit by October 31, 1987, for insertion into the PAP, a mass balance of all areas to be retopsoiled. This will include acreage figures of all locations to be retopsoiled, depth of topsoil to be redistributed, and amount and location of material presently stockpiled. The applicant must also commit to sample soils before reclamation on areas of the Lion Deck Portal that will be used for reclamation.

UMC 817.25 Topsoil Nutrients and Soil Amendments-(DD)

Existing Environment and Applicant's Proposal

The applicant proposes to supplement all reclaimed areas with 40 pounds of Nitrogen and 30 pounds of Phosphorus per acre (PAP, page 784-39). These application rates are based on soil tests conducted on 40 samples for Nitrogen and 69 samples for Phosphorus. Potassium, Iron and Zinc were also analyzed for, but these parameters did not show deficiencies; therefore they will not be supplemented.

Compliance

According to recommendations by Utah State University (Personal communication from Carl Topper), the proposed supplementary rates for Nitrogen and Phosphorus are within adequate ranges. It should be recognized that there are many forms of Nitrogen fertilizers available, and when selecting a Nitrogen form, season of application is important to consider. Nitrate and Ammonium are the forms available for plant uptake. Nitrate is readily leached from the soil because of its negative charge, therefore a fall application of this form may be mostly lost from the soil before it can be used by plants in the spring. A fall application of an organic form of Nitrogen, such as Urea, would help prevent this loss because Urea must first be converted to Ammonium and then to Nitrate by soil microorganisms before it can be used by plants or leached from the soil. This conversion is temperature dependent, so in the cooler winter months when plants and soil microbes are inactive, most of the applied Nitrogen will be retained in the soil.

The applicant does not propose to use an organic mulch on areas that will be drill seeded. An organic amendment should not be ruled out in all cases. During reclamation there may be site specific cases which could benefit from an organic mulch; these would include sandy soil materials with little inherent organic matter content. The added organic matter will increase the water and nutrient holding capacity of these materials and aid in revegetation. Clayey soils derived from the Mancos shale also can benefit from organic

amendments. The organic matter increases infiltration and can improve soil structure and lower temperatures of these dark carbonaceous shales. Organic mulches also provide surface protection and are important for erosion control on steep slopes (at the time of final reclamation, the Division may require mulches on a site specific basis; see UMC 817.114)

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.41-.42 Hydrologic Balance: General Requirements

Existing Environment and Applicant's Proposal

Ground Water-(RVS)

The applicant provides information about aquifers, springs and mine inflows on pages 783-7 through 783-52, 784-59, 784-60, 784-63, 784-64 and 784-80 through 784-105 of the PAP. Supplementary ground water data are given on Maps 25, 26, 27, 28, 31, and in Tables 4 through 9.

Aquifers. The applicant describes undifferentiated North Horn/Price River formation and the Blackhawk Formation/Star Point Sandstone as the major water-bearing lithostratigraphic units in the permit and adjacent area. The applicant concludes that a zone of "perched" aquifers occurs within certain permeable lithologies of the undifferentiated North Horn/Price River formation, whereas a regional aquifer occurs within the Blackhawk Formation/Star Point Sandstone. The applicant also delineates a north-south trending extensional fault and joint system that functions as a significant conduit for ground water. A preliminary piezometric surface for the regional aquifer is given on Map 27.

Ground-Water Use. Ground water within and adjacent to the permit area is used by wildlife and for stockwatering, domestic and industrial purposes. Table 9 lists 72 ground-water rights and Map 30 shows 78 ground-water rights within and adjacent to the permit area. Of these, 28 ground-water rights occur within the permit area. Mining has occurred beneath seven ground-water rights and is projected to occur beneath an additional nine ground-water rights.

Springs. Table 7 and Map 27 indicate 201 springs and ten seeps occurring within and adjacent to the permit area. Total discharge from springs is approximately 1200 gpm (Table 7). One hundred fifty-one (151) springs are identified as discharging from the

"perched" aquifer zone (about 1000 gpm); 25 springs discharge from the Castlegate Sandstone (about 60 gpm); 18 springs discharge from the regional aquifer (about 70 gpm); and seven springs discharge from the Mancos Shale (about 45 gpm).

Table 4 summarizes 99 water quality samples, collected between 1979 and 1985, for 11 springs that discharge from the "perched" aquifer zone. Table 7 presents 58 water quality analyses from 1986 for an additional 58 springs. These data indicate water from the "perched" aquifer zone average 260 mg/l bicarbonate, 238 mg/l TDS, 66 mg/l calcium and 20 mg/l sulphate. Three samples from three springs discharging from the Castlegate Sandstone were acquired for water quality analyses during 1986 (Table 7). These data indicate water from the Castlegate Sandstone is similar to water from the "perched" aquifer zone. Four samples from four springs that discharge from the regional aquifer were acquired for water quality analyses during 1986 (Table 7). These data differ from overlying ground-water resources in that the average water quality is degraded (e.g., 317 mg/l HCO_3 , 298 mg/l TDS, 72 mg/l Ca, 298 mg/l SO_3). Three samples from three springs located in the Mancos Shale were acquired for water quality analyses during 1986 (Table 7). These data indicate water quality is further decreased within the Mancos Shale (e.g., 393 mg/l HCO_3 , 442 mg/l TDS, 91 mg/l Ca, 88 mg/l SO_3).

Mine Inflow. Total mine inflow is measured at 16 monitoring locations (Map 28) and estimated to be 134 gpm, whereas total discharge from the mine is approximately 129 gpm (Table 8). The difference (5 gpm) between inflow and discharge values reflects in-mine and culinary water uses. Mine inflows are considered to be regional aquifer discharge. Five samples from these monitoring locations were acquired for water quality analyses during 1985 (Table 6). These data indicate mine inflow from the regional aquifer has the poorest water quality (e.g., 375 mg/l, HCO_3 , 442 mg/l TDS, 91 mg/l Ca, 319 mg/l SO_3).

Mine inflow is collected at two major sump areas entitled the "Mother Goose Sump" located in the Wattis seam and "Father Goose Sump", located in the Third seam (PAP, p. 783-44). Water from the "Father Goose Sump" is used for coal washing, fire protection and mining operations. Excess water from the "Mother Goose Sump" is discharged to the surface at Mud Water Canyon.

Mining Methods. Room and pillar mining has occurred beneath Star Point in all three coal seams and is projected to occur in the Hiawatha seam beneath the northern portion of Hoag Ridge. Approximately six springs overlie these previously mined areas. Longwall mining is currently occurring within the Wattis seam and is projected to occur within the Third seam beneath the northern portion of Hoag Ridge where overburden thickness ranges from

approximately 700 to 1500 feet. Approximately eight springs overlie these areas of current and projected mining. Longwall mining is also projected to occur in the Wattis seam beneath Gentry Ridge where overburden thickness ranges from approximately 1000 to 1700 feet. Approximately 30 springs overlie this area of projected mining.

Graben Crossing. The applicant proposes to develop a two-or three-entry tunnel across the Bear Canyon Graben to access the Wattis seam beneath Gentry Ridge. Boreholes CVR-5A, 83-14-3-C and CVR-6 encountered ground-water resources within Bear Canyon Graben. A comparison of water levels from CVR-5A (8,445 feet) and 83-14-3-C (8,315 feet) with water levels from boreholes drilled in areas of current mining (P-86-02-HD, P-86-03-WD, P-86-01-TD) suggests the regional aquifer occurs at a lower elevation within Bear Canyon Graben. The elevated water level (8,741 feet) penetrated by CVR-6 may be due to the occurrence of a localized saturated zone, either associated with encountering a zone of fault gouge or other permeable lithology.

Borehole 86-26-6 encountered the regional aquifer beneath Gentry Ridge at an elevation of 8,160 feet (personal communication, 2/4/87, B. Grimes). This data suggests that the piezometric surface of the regional aquifer beneath Gentry Ridge is elevated with respect to Bear Canyon Graben. If the ground-water gradient is similar to that derived from in-mine boreholes (Map 27), then mining operations beneath Gentry Ridge may encounter the regional aquifer in close proximity to the western terminus of the access tunnel.

As discussed previously, faults (and associated breccia zones) within and bounding Bear Canyon Graben are believed to function as significant conduits for ground-water movement. The applicant provides information about ground-water inflows that resulted from mine workings contact with the eastern boundary fault zone at the 10th West Section (8,180 feet) in the King IV Mine and 2nd Left (8,490 feet) and 2nd West Mains (8,780 feet) in the Star Point No. 1 Mine. Sustained high inflow has occurred at fault zone encounters in the King IV Mine, whereas inflows have diminished rapidly in the Star Point No. 1 Mine. A lateral borehole drilled approximately 400 feet into the Bear Canyon Graben from the 2nd Left Section in the Star Point No. 1 Mine experienced an initial flow of 150 gpm that eventually decreased to zero. These data suggest that the eastern boundary fault zone in the vicinity of active operations in the Star Point No. 1 Mine does not function as a significant conduit for ground water. However, towards the south along the western side of Hoag Ridge the eastern boundary fault zone conveys a significant amount of ground water and is considered to be the recharge source for three Huntington City wells located near the junction of Wild Cattle Hollow and Gentry Hollow (PAP, page 784-95).

The applicant infers that ground water is recharged along Hoag Ridge and infiltrates towards the southwest until encountering the gouge (impermeable) zone associated with the eastern boundary fault zone. Thereafter, ground water is conveyed adjacent to the gouge zone within permeable breccia and/or fracture zones.

Data are not available to demonstrate whether the western boundary fault zone or other faults internal to the Bear Canyon Graben transmit significant amounts of ground water. However, if the Gentry Ridge ground-water regime is similar to that postulated for Hoag Ridge, wherein ground water moves from areas of high to lower topographic relief, then access tunnel development may encounter significant inflow at the western boundary fault.

The applicant proposes to control "significant sustained inflows . . . encountered during the Graben Crossing . . . by use of a pressure grouted seal (PAP, p. 784.63)." Map 46 depicts cross-sectional diagrams of pressure-grouted injection holes for arched and rectangular tunnels.

Surface Water-(TM)

The applicant provides information about sediment pond discharges, disturbed area drainage plans and control, and general surface water quality information on pages 783-53 through 783-67, 784-62 through 784-88 and 784-116 through 784-130. Supplementary surface water data are given on Maps 26, 19, 31, 42, 43, 50 through 60, Tables 10 through 14, 75 through 82, and 84 through 88, and on Figures 10 through 18 and 21 through 37.

Seven sediment ponds and one treatment facility are used to treat disturbed area drainage at Plateau's mine. Ponds No. 2, No. 4, No. 6, No. 7 and No. 8 are certified by a registered professional engineer (Exhibit 31, PAP). A variance was granted by the regulatory authority following a stability analysis for sediment ponds No. 3 and No. 5, and treatment facility No. 1.

Compliance

Ground Water-(RVS)

The applicant has provided information about the use, occurrence and characteristics of ground-water resources within and adjacent to the permit area. Moreover, the extent and location of underground coal mining activities (past, present and future) have been identified and described.

Springs. Baseline and operational spring monitoring data have been superimposed over projected areas of mining to identify potential impacts to the ground-water resource. Although overburden

thickness in conjunction with extraction methods suggest minimal longwall-induced aquifer deformation, the applicant recognizes that the potential for impacts to spring recharge and discharge above mine workings and the productivity of the Huntington City wells cannot be totally precluded. The applicant proposes to conduct water monitoring at representative springs and the Huntington City wells to identify longwall-induced impacts.

Mine Inflow. Mine inflow rates have been quantified and a limited suite of water quality data indicates inflows and subsequent discharges to Mud Water Canyon exceed effluent limits. The applicant has submitted a request for approval to exceed effluent limits and commits to initiating remedial action on halting discharges as required by the Utah State Health Department (PAP, pages 817-2 and 817-3).

Graben Crossing. The applicant proposes to drive a tunnel across Bear Canyon Graben to access coal reserves in Lease U-13097. Piezometric data indicate that the regional aquifer will not be encountered within the graben, but will be intercepted during early development of Lease U-13097. Tunnel development will intersect the east and west boundary fault zones and three faults that occur within the graben. Available data suggests the tunnel will not encounter significant inflow at the eastern boundary fault zone. However, data are not available to determine whether the western boundary fault zone acts as significant ground-water conduit. The applicant commits to drilling a horizontal borehole through the western boundary fault zone to assess ground water resources and the need to initiate a pressure-grouting program (PAP, page 784-64a). Pressure-grouting will be initiated if inflow exceeds 50 gpm for longer than three months, and will continue until sustained inflow is decreased by 90 percent. If inflow exceeds 50 gpm, the operator commits to installing water seals at each end of the tunnel upon abandonment (PAP, page 784-63).

The applicant is in compliance with this section.

Surface Water-(TM)

All NPDES discharges have been made in compliance with the discharge permits except for sediment pond No. 8. Plateau studied the effluents and inflows to pond No. 8 for a one-year period after which a request for change of the limitation was made to State Health and E.P.A. based on the results of that year's data. The operator applied for a revised limit as of December, 1986, and upon receiving this permit will revise their current limit. They are currently operating under a 1-Ton, 1-Day dissolved solids limit until this permit application is reviewed and approved.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.43 Hydrologic Balance: Diversions and Conveyances of Overland Flow, Shallow Ground Water Flow, and Ephemeral Streams-(TM)

Existing Environment and Applicant's Proposal

The discussion of applicant's disturbed and undisturbed area drainage conveyance system, peak flow determination, and methodologies, sediment control, channel flow design, channel lining design, and culvert design, is given on pages 784-65 through 784-74 of the PAP.

Compliance

The applicant has met all the requirements regarding peak flow methodologies and determinations for diversions in regards to this regulation. The applicant has not supplied the necessary information to verify culvert sizing, inlet and outlet protection, riprap location, riprap type, and showing this information on maps.

The applicant will be in compliance with this section when the following stipulation is met.

Stipulation 817.43-(1)-(TM)

Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, flow, velocity, and sizing calculations, location maps, and inlet and outlet protection measures for all culverts in the disturbed area.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions-(TM)

Existing Environment and Applicant's Proposal

The applicant does not address reclamation of any channels in their current reclamation plan. No place in their current Permit Application Package summarizes or provides detailed plans for channel reclamation techniques or channel stabilization after reclamation.

The applicant has stated in their Initial Completeness Review response document that for a reclamation plan to be completed, it will require detailed investigations into channel reclamation techniques and channel stabilization.

Compliance

The current PAP as it exists was approved by Office of Surface Mining, Reclamation and Enforcement without a detailed channel reclamation plan. The applicant must bring the current PAP into compliance with current regulations.

The applicant has not supplied the necessary information to address channel reclamation concerns. The applicant will be in compliance with this section when the following stipulation is met

Stipulation 817.44-(1)-(TM)

Plateau Mining Company shall submit by October 31, 1987 for inclusion in the PAP, complete and adequate design, calculations, profiles, cross sections, and drawings to detail final reclamation and channel restoration measures which will be employed. This will include post mining drainage patterns, and water monitoring locations.

UMC 817.45-.47 Hydrologic Balance: Sedimentation Ponds-(TM)

Existing Environment and Applicant's Proposal

Seven sediment ponds and one treatment facility have been constructed in conjunction with the runoff control plan and as on-site water pollution control facilities. These structures have been designed to contain the 10-year 24-hour design storm runoff event from disturbed areas and to remove excess suspended sediments picked up from the disturbed areas. They are temporary in nature and will be removed upon completion of the mining operations. No past, present, or future mining has, or will be, conducted beneath any existing sediment pond. One mine water discharge is located in Mud Water Canyon.

The overall sediment control plan, including pond location, drainage area characteristics associated with each pond, and other required runoff facilities are illustrated in Map 42 and 43, Surface Water and Sedimentation Control Facilities, Maps A and B (page 784-118, PAP).

Design details for the one treatment facility is shown on Map 53. Sediment Pond design details for ponds 2 through 8 are illustrated on Maps 54 through 60. A stage capacity curve for Treatment Facility 1 is shown on Figure 28, Stage Capacity Curve for Treatment Facility No. 1. The stage capacity curves for the as-built ponds are presented on Figures 29 through 35, Stage Capacity Curve for Sediment Ponds 2 through 8.

Additional Design Details for Sediment Volume, Runoff Volume, Pond Detention, Spillway Capacity, Embankment Height and Width, Side Slopes, Anti-Seep Collars, Riprap Protection, and Compactions are discussed on page 784-119 through 784-128 of the PAP. The adequacy of these design parameters will be discussed in the Compliance section.

Compliance

The applicant adequately describes the standard engineering practices used to design, construct, and certify all treatment facilities at Plateau (p. 784-117 and 784-118). All of the sedimentation ponds have been approved by the Division. The eight sedimentation ponds are classified as Treatment Facility No. 1 and Sedimentation Pond Nos. 2 through 8. Sedimentation Pond No. 1 was officially designated as Treatment Facility No. 1 by a letter from Dianne R. Nielson to PMC on July 19, 1984. Additionally, variances were granted for Sedimentation Ponds #3 and #5 for 817.46(r) (design and inspection during construction under the supervision of a registered professional engineer). As-built survey information was submitted for Ponds #3 and #5 with a certified stability analysis. The Division granted variances for these two ponds in a letter dated December 7, 1984.

Sedimentation ponds #4, #6, and #7 were certified on November 16, 1981. Sedimentation Pond #2 was certified on August 19, 1986. Sedimentation Pond #8 was certified and approved with the Unit Train Loadout, May 2, 1985.

The sediment design parameters for Ponds 1 through 8 have been summarized in Table 85. The applicant has not stated the design cleanout elevations for any of their ponds. In the applicant's response to the Division's renewal review, the applicant stated that he will survey the ponds to determine if they have reached the 60 percent cleanout level, and then determine if cleanout is necessary. Therefore, the applicant will include on their quarterly pond inspection forms, the cleanout volume (ac. ft.) for each facility and an updated sediment volume (ac. ft.) based on a current survey of each facility. This will supply adequate documentation for inspection of these facilities to be carried out.

The applicant states that the riprap protection for all ponds and treatment facilities is currently in place in inlet channels, around spillway risers, and at spillway outlets. The applicant has chosen to postpone a response to the Division's request for the D-50 of the riprap, manning's n values, and the depth, width and length of protection for all pond inlets and outlets. The applicant states that this will require assembling data from past submittals and field work to verify inlet and outlet protection, riprap location, riprap type, and showing this information on maps.

The applicant will be in compliance when the following stipulations are met.

Stipulation 817.45-.47-(2)-(TM)

1. Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, detailed calculations, maps and drawings showing the nature and location of pond outlet and inlet protection measures presently installed with supporting calculations which demonstrate the adequacy of these measures.
2. Plateau Mining Company will include on their quarterly sediment pond inspection forms, the cleanout volume (Ac.Ft.) for each facility and an updated sediment volume (Ac.Ft.) based on a current survey of each pond and treatment facility.

UMC 817.48 Acid-Forming and Toxic-Forming Materials-(DD)

Existing Environment and Applicant's Proposal

Page 783-132 of the PAP states sufficient evidence is available to quantify that the coal refuse material is not acid or toxic-forming as defined in UMC 700.5, and therefore does not need to have four feet of buffer material applied prior to topsoiling. Given the available data, the applicant requests that the Division concur with this position.

The available data, Table 64 of the PAP, gives chemical and physical analysis of the Coal Refuse. A series of test plots were also initiated on the Coal Refuse to determine adequate topsoil depths for reclamation. Sampling results from the test plots are submitted annually in the applicant's annual report.

Compliance

At this time it is premature for the Division to agree with the applicant's position that the coal refuse is non-acid or toxic-forming.

Sample locations of the coal refuse in Table 64 of the PAP were not located on a map of the coal refuse, and explained if the samples are depth increments or individual surface samples across the refuse pile.

Although most parameters appear to be within acceptable limits, Ec values are saline for samples WP2 middle, B-2, B-3, and VHA. Samples 12058 and 12059 are above suspect concentration for

selenium. Procedures used to analyze refuse and soil parameters need to be submitted to determine if values are total concentrations or plant available concentrations.

The test plot study must be completed and the refuse must be sampled in a representative fashion to determine the presence of acid or toxic-forming materials.

The applicant is currently developing an operational plan to address the presence of acid or toxic-forming materials in each stratum of overburden to be removed, including the stratum immediately above and below each coal seam to be mined and materials presently in the refuse pile. The plan shall include a discussion of the potential for, and mitigation of, water quality impacts and revegetation problems attendant to the refuse pile. This plan shall be submitted by September 15, 1987. After submittal, the plan will be reviewed for completeness by the Division.

The applicant will be in compliance with this section when Stipulation 817.71-.74 is met.

Stipulations

(See UMC 817.71-.74)

UMC 817.49 Temporary and Permanent Impoundments-(PGL)

Applicant's Proposal

Treatment Facility #1 and Sediment Ponds #2 through #8 are the only impoundments on the permit area. Page 784-129 states that temporary impoundments will be reclaimed upon completion of mining. Page 784-145 notes ponds may be permanently retained for wildlife use. All impoundments are less than 20 acre feet.

Compliance

Since the applicant is potentially planning to retain some impoundments for the postmining land use, the application has not addressed this section. The applicant will be in compliance with this section when the following stipulation is met.

Stipulation 817.49-(1)-(PGL)

Prior to final reclamation, Plateau Mining Company must submit definite plans for the disposition of all of the impoundments. If the applicant retains any of the impoundments permanently, all of the criteria for permanent impoundments must be met according to UMC 817.49.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharge-(RVS)

Existing Environment and Applicant's Proposal

Rocks in the mine plan and adjacent area strike northwest and dip approximately three degrees to the southeast. Mine inflow is measured to be 134 gpm and is collected in two sump areas prior to dispersal throughout the mine and to surface discharge. Mine inflow is of marginal quality.

Portals are updip from the workings and located at elevations ranging from 8,600 to 8,400 feet. Lion Deck Portal is located at the lowest elevation. Portal seals incorporate two-inch diameter drain pipes to accommodate the flooding of workings and associated build-up of hydraulic head following mine closure.

Compliance

Portals were located and constructed to control gravity discharge from the mine. The mine currently experiences inflows of marginal water quality.

Following mine closure, workings will flood and unplanned discharges of marginal water quality may occur. The applicant commits to monitoring unplanned discharges after mining for compliance with UMC 817.42 and other applicable state and federal regulations. Monitoring will be conducted quarterly (as accessible) and treatment will be initiated, if necessary, during the period of discharge or until bond release (PAP, page 817-4).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Surface and Ground Water Monitoring-(RVS/TM)

Existing Environment and Applicant's Proposal

Baseline water quality samples will be analyzed for the parameters listed in Table 82, Baseline Low Flow Water Quality Analytical Schedule. Operational water quality samples will be analyzed for the parameters presented in Table 81, Operational Water Quality Analytical Schedule. Baseline and operational monitoring will be conducted at the monitoring stations identified on Map 26, Ground and Surface Water Monitoring Sections with Water Quality Data in accordance with the time schedule indicated in Table 80.

The parameter sampling frequency procedures and future sampling intent has been stated on pages 784-79 through 784-88 of the PAP.

On April 9, 1987, the Division met with Plateau Mining Company (PMC) to discuss a revised spring monitoring plan based on the information received to date. Based on that meeting, PMC proposes to drop from the plan as outlined in the 5-year permit renewal PAP and New Lands PAP the following springs: S17-2, S7-1, S11-1, 530, 85-26-1, 734 and 452. The following springs will be added to those sampled: 518, 429, 433, 443, and 444.

Springs 429, 433, 443, and 444 will be monitored for baseline starting this year, then dropped until mining commences in Lease U-13097. Spring 518 will be monitored on an operational basis starting this year.

Compliance

The Division has concurred with the applicant on their revision to the proposed monitoring schedule in the PAP. The Forest Service has reviewed these changes and discussed these changes with the Division in a June 2, 1987 meeting. They also concur with these changes except that they would like the applicant to continue monitoring Spring S11-1 through 1987 with at least one sample being collected at low flow. This request was based on the water rights associated with Little Park Creek and mining to the east of this spring. The Forest Service will assess the data collected from sampling Spring S11-1 at the end of this year to determine if they would like continued monitoring in 1988. USFS is also compiling a list of springs on their own this field season, and this winter will provide a comprehensive list of high resource value springs.

The applicant has proposed to drop certain parameters from their surface and ground water quality sampling program. The Division does not concur with elimination of the baseline parameters spelled out on pages 784-82 through 784-85 for baseline data collection. If at the end of one year's baseline data collection for new sites (four water quality samples including high and low flow), certain parameters (those mentioned on pages 784-82 through 784-85 of the PAP) are not found in significant concentrations, then the Division would consider approving an amendment to the plan for the the second year of baseline monitoring. The complete baseline parameter list will be sampled every fifth year for all sites.

The applicant will be responsible to keep the Division informed of mining sequence changes on a yearly basis so that spring monitoring sites can be revised according to mining sequence changes and adequate baseline data can be collected prior to any mining impacts being realized.

The applicant will be in compliance with this section when the following stipulation is met.

Stipulation 817.52-(2)-(TM)

1. Plateau Mining Company (PMC) shall upon permit approval, utilize the monitoring stations proposed in PMC's April 30, 1987 letter to the Division. Moreover, PMC shall monitor springs S11-1, 238, and 494 at least one time in 1987 during low flow conditions in accord with the approved monitoring plan.
2. By October 31, 1987, Plateau Mining Company shall update the PAP water monitoring plan including text and tables, to:
 - a. reflect the revised monitoring stations proposed in PMC's April 30, 1987 letter to the Division as well as to add springs 238 and 494 to the monitoring program.
 - b. reflect that all new source and existing baseline monitoring points for surface and groundwater monitoring shall be monitored in accord with the Division's baseline parameter list for a two year period.

UMC 817.53 Hydrologic Balance: Transfer of Wells-(RVS)

Existing Environment and Applicant's Proposal

The applicant states that upon final reclamation, ground-water monitoring wells will be sealed from bottom to top (PAP, page 784-58) and exploration boreholes will be plugged following abandonment (PAP, page 784-57).

Compliance

The applicant indicates exploration boreholes and ground-water monitoring wells will not be transferred for further use as water wells.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(KMM)

Existing Environment and Applicant's Proposal

The permit area contains the headwaters of two small perennial streams - Miller and Tie Fork Creeks. The latter includes Gentry Hollow and Wild Cattle Hollow Forks. There is currently no mining or surface facilities within 100 feet of these streams. Aquatic resource studies (pages 783-115 to 123) indicate no degradation to water quality or quantity from the applicant's operations. Subsidence cracks are the only surface disturbances in the Miller Creek drainage area and these are limited to the ridge (page 783-121). Subsidence is not expected to impact Wild Cattle or Gentry Hollow (page 783-122).

Mine water discharge from the Mudwater Fan Breakout has changed Mudwater Creek to a perennial stream. The water discharge is subject to an NPDES permit and is monitored regularly to determine impacts on water quality (page 784-146).

The Corner Canyon Fan Breakout is the only facility in proximity to an intermittent channel. The breakout was constructed so as not to impact the stream and the site has been posted for a stream buffer area (page 784-147).

Compliance

Mining activity, except for the breakouts described above, has not and is not expected to disturb land within 100 feet of a perennial or intermittent stream. Continued spring and stream monitoring is conducted to document any changes in water quality or quantity which might necessitate mitigation. The applicant is committed to mitigate impacts to water quality or quantity that affect wildlife (page 784-145d).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery-(PGL)

Existing Environment and Applicant's Proposal

The operator has committed to maximum coal recovery while using the best technology currently available and maintaining environmental integrity through underground coal mining activities. An approved Resource Recovery and Protection Plan is shown in Exhibit 39.

Compliance

The applicant's Resource Recovery and Protection Plan approved March 20, 1981 is valid.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Explosives-(PGL)

Existing Environment and Applicant's Proposal

For surface blasting activities incident to underground coal mining in the Star Point Mines, the applicant will comply with all Federal and State laws in the use of explosives. Blasting will be conducted by certified blasters only. Records of surface blasts will be filed at the minesite for 3 years (PAP, page 817-17).

Compliance

The applicant commits to comply with all applicable State and Federal laws for surface blasting activities incident to underground coal mining.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.71-.74 Disposal of Underground Development Waste and Excess Spoil and Non-Acid and Non-Toxic Forming Coal Processing-(PGL)

Existing Environment and Applicant's Proposal

The applicant presently disposes of underground development waste and excess spoil in the coal processing waste pile which is located south and east of the preparation plant.

The mine development will proceed through a Graben crossing. The development waste from the graben crossing is proposed to be conveyed to the surface by the regular coal conveyor. Rock may be mixed with the mined coal and conveyed to the coal preparation plant where it will be removed during the coal washing. The waste rock will then be mixed with the regular coal refuse and deposited on the refuse pile (page 784-133).

Two other alternatives for the proposed development waste have been proposed. The waste may be conveyed by conveyor belts on on-shifts to the surface where it would be disposed directly on the refuse pile. The other alternative would be the creation of "gob" rooms underground for the waste rock disposal. (Approximately 45,000 cy of material are involved in this development.)

The "refuse pile" used for the waste rock disposal was designed by professional engineers (and is certified). Recent stability investigations by Chen and Associates verified the stability of the fill (Geotechnical investigation in Exhibit 38, dated December 5, 1986).

The fill is continually being placed and compacted. The lifts are 2 feet, and designed to ensure mass stability and prevent mass movement. The outslope of the fill is 2H:1V.

Compliance

The applicant has proposed three alternatives for the disposition of the development waste. The waste program must be specific and identify the provisions for disposal of acid or toxic forming materials.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.71-.74-(1)-(PGL/DD/RVS)

The Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, an operational plan for collection and analyses of each stratum of overburden to be removed, including the stratum immediately above and below each coal seam to be mined, graben crossing waste rock, and materials presently in the refuse pile, to identify potential acid or toxic-forming, or alkalinity producing materials. The plan shall include a discussion of the potential for, and mitigation of, water quality impacts and/or revegetation problems attendant to the refuse pile. Moreover, the operator shall submit the calculated volume of waste rock to be generated during the permit term.

UMC 817.81-.88 Coal Processing Waste Banks-(DD/PGL)

Existing Environment and Applicant's Proposal

The refuse pile for the PMC preparation plant is located south and east of the plant site. Currently, the waste pile is in Phase II as described in Exhibit 33, Star Point Mines Refuse Pile Evaluations, Operation and Maintenance Plan. This plan contains a detailed operation and maintenance plan.

Page 784-17 outlines how the refuse pile will be operated including spreading the refuse in two foot lifts, compaction will achieve 90 percent of the maximum dry density, and side slopes will be constructed at a maximum 2H:1V. The refuse pile plan continues and commits to monitoring and maintenance procedures throughout the life of the mine (detailed on page 784).

Waste rock generated from the underground projects which is known to be non-acid or non-toxic is transported to the refuse pile. The estimated amount of waste rock is 45,000 cy (page 784-133), which at the present projections, would be 2.15 feet over the active portion of the refuse pile or one lift. When the coal processing waste pile is full or no longer needed, it will be reclaimed by covering with suitable material and revegetating the area with the approved seed mixture. There are a series of test plots constructed in the area to determine vegetation success with differing soil material at various depths.

Compliance

The applicant's operational and maintenance procedures are acceptable as described in the PAP. Recent stability investigations as of December 1986 have demonstrated stability. The reclamation of the site will depend upon the results of the series of test plots. Presently, however, the bond estimate consists of covering the area with four feet of topsoil unless successfully demonstrated otherwise with the series of test plots.

The applicant commits to "visual monitoring quarterly, for evidence of structural weakness, ponding or impounded water and general appearance" (page 784-16). This inspection will be conducted by a registered professional engineer or other person approved by the Division. All of the monitoring procedures are acceptable.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.89 Disposal of Non-Coal Waste-(PGL)

Existing Environment and Applicant's Proposal

There are dumpsters and concrete containment areas located throughout the mine area where non-coal waste is collected. The non-coal waste is hauled to the Carbon County landfill (page 784-16).

Compliance

The applicant collects non-coal waste in a designated portion of the permit area and removes it to the approved Carbon County landfill.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.91-.93 Coal Processing Waste: Dams and Embankments-(PGL)

Existing Environment and Applicant's Proposal

The coal processing waste dams and embankments are not employed at the Star Point Mines. A thickener tank is utilized to settle out fines from the preparation plant process water.

Discharge from the thickener underflow treatment ponds is recycled back to the coal wash plant, and is not released back into natural stream courses. Therefore, these regulations are not applicable.

UMC 817.95 Air Resources Protection-(PGL)

Existing Environment and Applicant's Proposal

The applicant outlines on page 784-153 that all surface operations including construction and reclamation operations are conducted utilizing dust control measures. Dust control approval orders have been received by the Utah State Department of Health for all facilities at PMC and are found in Exhibit 34.

Compliance

The applicant has approved dust control plans for all surface facilities at the mine. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values-(KMM)

Existing Environment and Applicant's Proposal

On pages 783-93 through 783-124, the operator describes the fish and wildlife resource of the permit area and affected adjacent areas. Information is based on literature, consultation with appropriate agencies, and field studies. Continuing studies include annual raptor surveys, and water quality and quantity monitoring which will identify potential problems.

Compliance

Much of the Star Point Mine's facilities were in existence before passage of SMCRA or Utah's Rules. Wildlife has adapted to some extent to the presence of the mine as evidenced by big game use of sediment ponds and wildlife sightings in the mine facilities area. The applicant has tried to minimize impacts on wildlife from existing facilities and to design new facilities to take wildlife into consideration, including raptor-proof power lines and conveyors constructed to allow deer crossing (pages 784-144 - 145a). The applicant has committed to notify the Division of threatened or endangered species and their habitats, of the use of pesticides and fires and to fence, cover or buffer hazard areas (page 784-145d).

Mitigation of impacts and enhancement of wildlife resources include employee education, deer winter range vegetation enhancement and a guzzler to compensate for the Unit Train Loadout and refuse expansion areas (page 784-145b), availability of sediment ponds for deer use and interim and final revegetation planned to maximize benefit to wildlife.

Final reclamation will include retention of sediment ponds and vegetation enhancement of them if appropriate for wildlife use (see discussion following page 784-145). Stream channel reconstruction will include riparian vegetation re-establishment where appropriate.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits on page 817-19, that "at any time a slide occurs which may have a potentially adverse affect on public property, health, safety, or the environment, Plateau Mining Company

will notify the Division by the fastest available means and will comply with remedial measures that are required by the Division's standard safety and construction procedures".

Compliance

The applicant commits to notify the Division if a slide occurs and comply with standard and acceptable measures required by the Division. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation-(KMM)

Existing Environment and Applicant's Proposal

The applicant has committed to reseeding as contemporaneously as possible with regrading (page 784-49). Map 34, Disturbed Area Vegetation, indicates areas disturbed prior to August 3, 1977 and current disturbance. Areas of interim revegetation and final reclamation are also indicated.

Compliance

The applicant has either performed or committed to timely interim reclamation or final reclamation on all areas not currently used for mine facilities.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading-(PGL)

Existing Environment and Applicant's Proposal

The proposed final surface contour plan provides a variety of topographic features enhancing the postmining land use.

Backfilling operations, utilizing equipment such as rubber-tired scrapers, front-end loaders, and dump trucks will be undertaken in the portal, sedimentation pond, and stope hole areas. Holes or depressions will be filled when the mining operation is concluded. After the portals are sealed they will be backfilled (page 784-25).

Highwalls will be reduced by dragging a portion of the fill material from the outslope of the operation benches to the toe of the highwall. Roads will be reclaimed by pulling fill back up from the downslope and placing it in the cuts. Natural drainages will be re-established and erosion protection across the fill provided.

Some highwalls will be retained. The post-mining topography is graphically represented on Map 47 - "Post Disturbance Topography" and "Reclamation Cross Sections" on Map 49.

Compliance

The applicant described how the disturbed areas will be backfilled. The backfilling plan outlined on Map 47 where highwalls will be retained, but did not demonstrate how highwall retention criteria was met. The backfilling and grading did not demonstrate how a minimum static safety factor of 1.3 would be achieved.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.101-(1)-(PGL)

Plateau Mining Company shall submit by September 1, 1987, for inclusion in the PAP, cross sections, calculations, and plans to demonstrate that backfilled areas will meet the minimum static safety factor of 1.3. This shall include justification for retention of highwalls, and four more cross sections of the final configuration proposed for the coal refuse pile.

UMC 817.106 Regrading of Stabilizing Rills and Gullies-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits on page 817-20 that when rills or gullies deeper than 9" form in areas that have been regraded and topsoiled, the rills and gullies will be filled, graded, or otherwise stabilized.

Compliance

The applicant's commitment to fill, grade, or stabilize rills and gullies deeper than 9" in topsoiled or regraded areas meets the requirements of UMC 817.106.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.111 Revegetation: General-(KMM)

Existing Environment and Applicant's Proposal

Following completion of topsoiling and seedbed preparation, areas will be seeded with appropriate mixes (Map 73, Tables 70-79 and 93). Slopes accessible to a seed drill will be either drill seeded or dragged with a harrow or chain to adequately cover the seed (page 784-51). Areas too steep for a drill will either be broadcast or hydroseeded depending on accessibility. Seeding rates are provided in Tables 70-79 and 93. Seeding rates range from 52-87 PLS per square foot for drill seeding and 90-174 PLS for broadcast seeding (page 784-41).

Compliance

Seeding mixes and seeding rates have been calculated for prompt revegetation compatible with the designated post mining land uses. Tree and shrub seeding and planting rates and distribution have been designed to meet the woody density standards. PMC has also made the commitment to use grazing management to increase shrub densities if necessary. Grazing management is acceptable if it will result in meeting the success standard. Since bond release is dependent on meeting the success standard, proposed use of these revegetation and management techniques meet the requirements of UMC 817.111.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.112 Use of Introduced Species-(KMM)

Existing Environment and Applicant's Proposal

The applicant proposes use of small amounts of several introduced species in the seed mixes including Smooth brome, Timothy, Intermediate wheatgrass, Kentucky bluegrass, Alfalfa, Meadow foxtail, Yellow sweetclover, Regar meadow brome, Small burnet, Tall wheatgrass, Pubescent wheatgrass and Orchard grass (see Tables 70-73 and 75-79). The topsoil stockpile interim seed mix (Table 74) is predominantly introduced species.

Compliance

The applicant has provided a species by species and area by area justification for use of introduced species in permanent reclamation mixes. Various species are justified for their adaptability, forage quality, ease of establishment, value as a

nurse crop, nitrogen fixing ability and other soil building attributes. Small quantities of these species will not have a competitive advantage over natives and will add diversity to the permanent reclamation areas.

The principal justification for use of introduced species on the existing topsoil stockpile is their ability to "promote long term viability of the biological activity of the stockpiled soil material" based on rooting depth and overall root biomass.

The applicant has provided an extensive literature review to support their use of introduced species at the Star Point Mine. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing-(KMM)

Existing Environment and Applicant's Proposal

Following completion of topsoiling and seed bed preparation, seeding will be done in either spring or fall. The fall period may extend throughout the winter if soil is not frozen (page 784-48).

Compliance

Spring, if the site is accessible, and fall are normal periods for favorable planting conditions. If seeding is done in either period, the applicant will meet the requirements of UMC 817.133.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.114 Revegetation: Mulching-(KMM)

Existing Environment and Applicant's Proposal

The applicant proposes to mulch only on areas that are not drill seeded, harrowed or chain dragged to adequately cover seed (page 784-51). On areas too steep for the above treatments, an organic mulch (2000 lb/acre) or planted annual crop (20 lb/acre) will be used as mulch. Regrading to leave a roughened surface and pits, depressions and contour furrows will also aid in water retention and erosion control.

Compliance

The applicant performed two studies to evaluate various mulch treatments. While there were implementation problems associated with both studies, the information presented in conjunction with the literature review of mulching (Exhibit 40) is adequate to justify not mulching on relatively flat areas where seed is adequately covered. The Division may require mulch on a case by case basis if problem areas are evident, or if revegetation projects completed over the next permit terms indicate problems. Incorporation of organic mulch into the surface soil may also be required on a case by case basis if soil analyses indicate that organic matter would be beneficial.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.116 Revegetation: Standards for Success-(KMM)

Existing Environment and Applicant's Proposal

Reference areas have been established for all of the disturbed vegetation types (Map 34 and 36). Reference areas will be used for most cover and production standards. A woody density standard of 2200 plants per acre on east and north facing slopes and 900 plants per acre for south and west facing slopes has been negotiated for most reclamation sites. The applicant provides a history of permitting actions which led to establishment of this standard (see deficiency response document (January 5, 1987, p. 34-41). Map 73 specifies the reference area or other success criteria to be used at each reclaimed area.

For cover and productivity the 80/10 standard will be used for all shrublands (most types) and the 90/10 standard for herbaceous types (Mountain Grassland and Grass-Sagebrush) (page 784-54). Sampling techniques will be similar to those used over the last several years (10 point frames for cover and belt transects for density [page 783-77A and 784-53]).

Compliance

Cover and productivity are the basic parameters which must be measured for revegetation success. Shrub density must be considered for areas developed for fish and wildlife management. PMC proposes to measure all three parameters at the required statistical levels.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The applicant provides information about subsidence on pages 784-134 through 784-143. Supplementary subsidence information is given on Maps 5, 6, 61, 62 and in Table 89.

Mining will occur in the Hiawatha seam, Third seam and Wattis seam. Coal extraction will occur by longwall methods in the Wattis and Third seams and by continuous room and pillar methods in the Hiawatha seam (PAP, page 784-3). Multiple seam mining will primarily occur beneath the northern portion of Hoag Ridge (Section 12, T15S, R7E). The operator estimates that maximum subsidence will be 70 percent of extraction height (PAP page 784-136). Accordingly, in Section 12 where three seams are projected to be mined (total thickness of approximately 20 feet) cumulative maximum subsidence is anticipated to be less than 14 feet. Maximum subsidence beneath Gentry Ridge, where the Wattis seam is projected to be mined, will be less than 5 feet.

Overburden thicknesses range from 700 to 1500 feet in the northern portion of Hoag Ridge (includes Section 12) and 1000 to 1700 feet in the Gentry Ridge area. The operator gives a value of 22 1/2 degrees for the angle-of-draw within and adjacent to the permit area (PAP, 784-136). Map 61 locates subsidence-induced tension cracks that have developed over previously mined areas above Star Point.

The applicant identifies renewable resource lands above areas of current and projected mining. The applicant concludes, on the basis of mining methods, stratigraphy and overburden thickness that surface manifestations of subsidence (tension cracking, catastrophic failure) and impacts to renewable resource lands (springs, livestock grazing) will be minimal. However, where subsidence causes tension cracks that are hazardous to livestock or wildlife, the applicant commits to restoring the land surface. Where tension cracks preclude grazing or result in injured or killed livestock, the applicant commits to compensating owners at fair market value for losses. Ground-water resources (springs) that are materially damaged by mining-induced subsidence will be rehabilitated or mitigated (PAP, pages 817-22 and 817-23).

The operator identifies three structures (powerline, cabin, TV towers) that occur above areas that were mined prior to 1977 (Map 1, Sheet 2) and therefore, are considered to be located above areas that have stabilized. The operator does not anticipate subsidence-induced damage to these structures and does not propose specific mitigation plans.

The operator proposes to monitor vertical and horizontal ground movement by photogrammetric methods, surveying of monuments and visual observations during surface traverses. Photogrammetry will be the primary method for quantifying ground movement. Surface monument surveys will be utilized to determine the resolution of photogrammetric methods. Maps 61, 61A, and 61C show the subsidence monitoring points above longwall panels. Maximum measured subsidence, to date, is two feet (Map 61). The operator commits to conducting an annual field survey (surface traverse) and indicates that monument surveying will be conducted on an irregular basis and eventually phased out (PAP, p. 784-141). Results of surveys will be submitted to the Division on an annual basis (PAP, page 784-142). Surface owners will be notified of the mining schedule according to UMC 817.122.

Compliance

The applicant has provided information about mining methods and locations, overburden thickness and lithology, vertical movement, renewable resource lands and structures.

Maximum subsidence of up to 14 feet is projected for areas of Hoag Ridge where approximately eight springs occur. In addition, approximately 30 springs occur above portions of Gentry Ridge where maximum subsidence is projected to be less than five feet. The applicant cannot exclude the possibility of subsidence-induced material damage that results in the reduction of reasonably foreseeable use of surface lands and has provided commitments to restore surface lands and compensate owners in compliance with 817.124.

The applicant has identified structures above previously mined areas that have experienced vertical movement and are currently stable.

The applicant has provided a subsidence monitoring plan that describes schedules for collecting and submitting quantitative data as required by 817.121 and notifying surface owners according to 817.122.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.131 Cessation of Operations: Temporary-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to the requirements of 817.131 on page 817-24.

Compliance

The applicant commits to effectively support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit, even if temporary abandonment occurs.

The applicant will submit to the Division a notice of intention to cease or abandon operations if temporary cessation extends beyond 30 days, with all necessary information outlined in UMC 817.131.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Postmining Land Use-(KMM)

Existing Environment and Applicant's Proposal

The applicant describes pre-mining land use on pages 783-134 to 140. These include recreation, wildlife habitat, grazing, forestry and mining.

Compliance

The reclamation plan is consistent with these same uses (page 784-111), including enhancement of vegetation for wildlife, leaving sediment ponds for wildlife use and leaving the Lion Deck Portal road for recreation and other uses (see page 817.150-170.).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-.176 Roads-(PGL)

Existing Environment and Applicant's Proposal

On page 784-10, the applicant describes the silo access road and transfer tower access road. These roads are single lane, 15 feet wide, with a gravel surface.

The silo access road is 3,700 feet with a uniform grade of 0.75 percent. The transfer tower road is 1,000 feet long with an overall grade of 7.4 percent.

Compliance

The applicant did not adequately describe with descriptions, maps, and cross-sections, the configuration and reclamation of all the roads on the Star Point Mines permit area.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.150-.176-(1)-(PGL)

Plateau Mining Company shall submit by October 31, 1987, for inclusion into the PAP, detailed descriptions and specifications for each road within the permit area to include: maintenance and reclamation details, maps showing location, and cross sections of each road in the permit area.

UMC 817.180 Other Transportation Facilities-(PGL)

Existing Environment and Applicant's Proposal

The conveyor, railroad siding, and unit train loadout were designed and constructed and are maintained to prevent damage to environmental values. The maintenance of the facilities is outlined on page 784-15 of the PAP.

Compliance

The transportation facilities were designed and constructed, and are maintained to prevent damage to fish, wildlife, and related environmental values and minimize the degradation of water quality, minimize erosion and siltation, and pollution. The facilities will be removed in an environmentally sound manner.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.181 Support Facilities and Utility Installations-(PGL)

Existing Environment and Applicant's Proposal

The mine buildings, coal storage, sheds, shop and coal preparation were designed and constructed and are maintained as outlined on page 784-15 to prevent damage to environmental values.

Compliance

The applicant has designed and constructed and will maintain and remove, the support facilities in an environmentally sound manner.

The applicant is in compliance with this section.

Stipulations

None.

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TECHNICAL ANALYSIS ADDENDUM
Plateau Mining Company
Star Point Mine
ACT/007/006
New Lands Application

August 7, 1987

The following sections are modified versions of the Star Point Mines Five-Year Renewal Technical Analysis. Sections have been added and/or modified to appropriately discuss the New Lands addition in conjunction with the Five-Year Renewal analysis.

The primary focus of the New Lands Technical Analysis is in Section 18, T15S, R8E, where longwall mining poses potential subsidence related impacts.

*UMC 782.15 Right of Entry and Operation Information-(JJW)

Applicant's Proposal

The application depicts five additional parcels of land to be added to the existing Star Point Mines permit area (PAP Map 71 as revised). Map 2, Surface Ownership, indicates that Bureau of Land Management public lands outside the coal lease are included in the permit boundary.

Compliance

Since no additional surface disturbance is proposed for the BLM land being included in the permit area adjacent to the existing surface facilities, the application can be approved. However, as outlined in an April 22, 1987 letter from the BLM, if any additional surface disturbance is undertaken on BLM lands, the appropriate rights-of-way, permits and/or leases must be obtained.

The applicant will be in compliance when the following stipulation is met.

Stipulation UMC 782.15-1-(JJW)

Plateau Mining Company shall amend the Permit Application Package (PAP) by October 31, 1987 to commit that prior to initiating additional surface disturbance within the permit area on lands administered by the Bureau of Land Management, the required rights-of-way and/or permit will be obtained from the BLM.

*UMC 817.45-.47 Hydrologic Balance: Sedimentation Ponds-(TM)

Existing Environment and Applicant's Proposal

Seven sediment ponds and one treatment facility have been constructed in conjunction with the runoff control plan and as on-site water pollution control facilities. These structures have been designed to contain the 10-year 24-hour design storm runoff event from disturbed areas and to remove excess suspended sediments picked up from the disturbed areas. They are temporary in nature and will be removed upon completion of the mining operations. No past, present, or future mining has, or will be, conducted beneath any existing sediment pond. One mine water discharge is located in Mud Water Canyon.

Sediment traps are used in various locations on the property. Sediment traps where they are used in conjunction with sediment ponds are not designed structures. They vary in size but are generally less than 3,000 square feet and an average depth of four feet. They are equipped with an overflow culvert or a spillway channel. When they become silted in, they are cleaned out with loaders or a backhoe to make them functional again (PAP, page 784-121).

The overall sediment control plan, including pond location, drainage area characteristics associated with each pond, and other required runoff facilities are illustrated in Map 42 and 43, Surface Water and Sedimentation Control Facilities, Maps A and B (page 784-118, PAP).

Design details for the one treatment facility is shown on Map 53. Sediment Pond design details for ponds 2 through 8 are illustrated on Maps 54 through 60. A stage capacity curve for Treatment Facility 1 is shown on Figure 28, Stage Capacity Curve for Treatment Facility No. 1. The stage capacity curves for the as-built ponds are presented on Figures 29 through 35, Stage Capacity Curve for Sediment Ponds 2 through 8.

Additional Design Details for Sediment Volume, Runoff Volume, Pond Detention, Spillway Capacity, Embankment Height and Width, Side Slopes, Anti-Seep Collars, Riprap Protection, and

Compactions are discussed on page 784-119 through 784-128 of the PAP. The adequacy of these design parameters will be discussed in the Compliance section.

Compliance

The applicant adequately describes the standard engineering practices used to design, construct, and certify all treatment facilities at Plateau (p. 784-117 and 784-118). All of the sedimentation ponds have been approved by the Division. The eight sedimentation ponds are classified as Treatment Facility No. 1 and Sedimentation Pond Nos. 2 through 8. Sedimentation Pond No. 1 was officially designated as Treatment Facility No. 1 by a letter from Dianne R. Nielson to PMC on July 19, 1984. Additionally, variances were granted for Sedimentation Ponds #3 and #5 for 817.46(r) (design and inspection during construction under the supervision of a registered professional engineer). As-built survey information was submitted for Ponds #3 and #5 with a certified stability analysis. The Division granted variances for these two ponds in a letter dated December 7, 1984.

Sedimentation ponds #4, #6, and #7 were certified on November 16, 1981. Sedimentation Pond #2 was certified on August 19, 1986. Sedimentation Pond #8 was certified and approved with the Unit Train Loadout, May 2, 1985.

The sediment design parameters for Ponds 1 through 8 have been summarized in Table 85. The applicant has not stated the design cleanout elevations for any of their ponds. In the applicant's response to the Division's renewal review, the applicant stated that he will survey the ponds to determine if they have reached the 60 percent cleanout level, and then determine if cleanout is necessary. Therefore, the applicant will include on their quarterly pond inspection forms, the cleanout volume (ac. ft.) for each facility and an updated sediment volume (ac. ft.) based on a current survey of each facility. This will supply adequate documentation for inspection of these facilities to be carried out.

In the case of ditches 43, 44, and 45 designed and placed along the existing access road to Sediment Pond No. 4, located in Section 10, T15S, R8E, two sediment traps or silt fences will be used instead of a sediment pond. Since these structures are to be used in lieu of a sediment pond, the applicant must submit detailed drawings for the sediment traps planned, or the silt fences, if used. The dimensions suggested of 30 by 100 feet, 4 feet deep, appear in excess of a small sediment trap design.

The applicant states that the riprap protection for all ponds and treatment facilities is currently in place in inlet channels, around spillway risers, and at spillway outlets. The applicant has

chosen to postpone a response to the Division's request for the D-50 of the riprap, manning's n values, and the depth, width and length of protection for all pond inlets and outlets. The applicant states that this will require assembling data from past submittals and field work to verify inlet and outlet protection, riprap location, riprap type, and showing this information on maps.

The applicant will be in compliance when the following stipulations are met.

Stipulation 817.45-.47-(3)-(TM)

1. Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, detailed calculations, maps and drawings showing the nature and location of pond outlet and inlet protection measures presently installed with supporting calculations which demonstrate the adequacy of these measures.
2. Plateau Mining Company will include on their quarterly sediment pond inspection forms, the cleanout volume (Ac.Ft.) for each facility and an updated sediment volume (Ac.Ft.) based on a current survey of each pond and treatment facility.
3. Plateau Mining Company shall submit by October 31, 1987, detailed silt fence design drawings showing design height, materials used, and general field construction details. Moreover, PMC shall submit by October 31, 1987, detailed sediment trap design drawings showing size, depth and location, a 60 percent sediment cleanout elevation for these structures with a location map of a scale greater than Map 43, sufficient to determine drainage area, ditch location, and ditch length contributing to these structures.

*UMC 817.52 Surface and Ground Water Monitoring-(RVS/TM)

Existing Environment and Applicant's Proposal

Baseline water quality samples will be analyzed for the parameters listed in Table 82, Baseline Low Flow Water Quality Analytical Schedule. Operational water quality samples will be analyzed for the parameters presented in Table 81, Operational Water Quality Analytical Schedule. Baseline and operational monitoring will be conducted at the monitoring stations identified on Map 26, Ground and Surface Water Monitoring Sections with Water Quality Data in accordance with the time schedule indicated in Table 80.

The parameter sampling frequency procedures and future sampling intent has been stated on pages 784-79 through 784-88 of the PAP.

On April 9, 1987, the Division met with Plateau Mining Company (PMC) to discuss a revised spring monitoring plan based on the information received to date. Based on that meeting, PMC proposes to drop from the plan as outlined in the 5-year permit renewal PAP and New Lands PAP the following springs: S17-2, S7-1, S11-1, 530, 85-26-1, 734 and 452. The following springs will be added to those sampled: 518, 429, 433, 443, and 444.

Springs 429, 433, 443, and 444 will be monitored for baseline starting this year, then dropped until mining commences in Lease U-13097. Spring 518 will be monitored on an operational basis starting this year.

In regards to monitoring the Right Fork of North Fork of Miller Creek, the applicant plans on using Station ST-1 to monitor for any changes in flow. It will be monitored monthly June through October (PAP, page 784-62b). PMC will also inspect the stream channel of the North Fork of the Right Fork of Miller Creek during the season when access is possible (June through October).

The applicant has stated that they will monitor springs 229, S18-2, and 500 in their ICR/TD response. After looking at the springs in the vicinity and where they are located on the spring map, the applicant feels that these springs would be adequate to monitor for mining subsidence impacts.

Compliance

The Division has concurred with the applicant on their revision to the proposed monitoring schedule in the PAP. The Forest Service has reviewed these changes and discussed these changes with the Division in a June 2, 1987 meeting. They also concur with these changes except that they would like the applicant to continue monitoring Spring S11-1 through 1987 with at least one sample being collected at low flow. This request was based on the water rights associated with Little Park Creek and mining to the east of this spring. The Forest Service will assess the data collected from sampling Spring S11-1 at the end of this year to determine if they would like continued monitoring in 1988. USFS is also compiling a list of springs on their own this field season, and this winter will provide a comprehensive list of high resource value springs.

The applicant has proposed to drop certain parameters from their surface and ground water quality sampling program. The Division does not concur with elimination of the baseline parameters spelled out on pages 784-82 through 784-85 for baseline data collection. If at the end of one year's baseline data collection for new sites

(four water quality samples including high and low flow), certain parameters (those mentioned on pages 784-82 through 784-85 of the PAP) are not found in significant concentrations, then the Division would consider approving an amendment to the plan for the the second year of baseline monitoring. The complete baseline parameter list will be sampled every fifth year for all sites.

In Section 18, T15S, R8E, a separate assessment of impacts to surface and groundwater has been carried out due to potential impacts associated with undermining the NFRF Miller Creek. Based on the Division's monitoring guidelines and paucity of baseline data in this area and current mining sequence in Section 18, the following springs were chosen by the Division to be monitored: (Springs 229, 238, 239, 494, and 500). Springs 238 and 494 are in excess of the springs chosen for monitoring by Plateau.

Two sources of data exist to describe the hydrologic characteristics of surface waters found in the NFRF Miller Creek. The major source of data is found in Plateau's annual water quality data listings through 1986 for Station ST-1. This station is located approximately 3.3 miles downstream from the headwaters of the NFRF Miller Creek. Six years of record have been recorded at this site. The average flow for this site over the period of record is .56 CFS or 251.3 GPM with a high flow recorded on 6/13/85 of 2.0 CFS or 897.6 GPM and a low flow recorded on 2/18/81 of .05 CFS or 22.4 GPM.

At this same site the average electrical conductivity was 1334.7 UMHOS/CM with a high value recorded on 9/17/80 of 1900 UMHOS/CM and a low value recorded on 6/22/82 of 370 UMHOS/CM. Fourteen discharge values were used to complete the average and seventeen conductivity values were used to complete the average.

The second source of data for the NFRF Miller Creek is a stream survey completed on the upper reaches of the creek in Section 18 and 17, T.15S. R8E. The purpose of this survey was to identify the gaining and losing reaches of the creek in these two sections. Flow measurements and conductivity readings were taken approximately every 1000 feet. All inflows were identified and measured. If mining were to occur as identified in the New Lands Permit Application, Stations M-1 through M-8 would be the closest to the potentially subsided area. An average of the electrical conductivity readings in this reach of the creek was 391.3 UMHOS/CM for Stations M-4, 6 and 8. The total flow at Station M-8 was 62 GPM.

The data from each station in this portion of the creek identified each reach in this stretch of creek as a gaining reach.

From Station M-6 to M-8 was identified as gaining the most flow of +15 GPM.

The data collected at the downstream Station ST-1 does not adequately represent or define what is occurring in the upper reaches of Miller Creek. The variance in electrical conductivity, the abundance of springs and the physical distance of 3.3 miles between the two sites does not reflect similarities in data or provide an avenue for assessment between ST-1 and the upper reaches of the NFRF Miller Creek.

Both water quality and quantity of flow in the upper reaches of Miller Creek has not been well defined. A continuous monitoring station at M-8 on map 29 must be installed and that data must be collected on a continuous basis for at least 2 years on a monthly basis per Division guidelines to define the hydrologic resources of this reach of Miller Creek. Also, stream surveys in July and September defining gaining or losing reaches would be appropriate to define base flow recharge conditions in this reach of stream.

Baseline water quality parameters and baseline flow data from a continuous monitoring station at M-8 must be established for this reach of Miller Creek prior to any mining.

The applicant will be responsible to keep the Division informed of mining sequence changes on a yearly basis so that spring monitoring sites can be revised according to mining sequence changes and adequate baseline data can be collected prior to any mining impacts being realized.

The applicant will be in compliance with this section when the following stipulations are met.

Stipulation 817.52-(4)-(TM)

1. Plateau Mining Company (PMC) shall upon permit approval, utilize the monitoring stations proposed in PMC's April 30, 1987 letter to the Division. Moreover, PMC shall monitor springs S11-1, 238, and 494 at least one time in 1987 during low flow conditions in accord with the approved monitoring plan.
2. By October 31, 1987, Plateau Mining Company shall update the PAP water monitoring plan including text and tables, to:
 - a. reflect the revised monitoring stations proposed in PMC's April 30, 1987 letter to the Division as well as to add springs 238 and 494 to the monitoring program.

- b. reflect that all new source and existing baseline monitoring points for surface and groundwater monitoring shall be monitored in accord with the Division's baseline parameter list for a two year period.
3. Plateau Mining Company will, by August 31, 1987, install a continuous monitoring station at Station M-8 as shown on Map 29. PMC will begin to monitor stream flow continuously and water quality monthly from August 31, 1987 until October 31, 1987, weather permitting. Monitoring will be undertaken from June until October per the baseline water quality parameter list through 1988 and 1989.
4. Plateau Mining Company will amend the current PAP by August 31, 1987 to commit to carry out stream surveys equivalent to the one carried out in the NFRF Miller Creek on July 2, 1986, in July and September of every year mining occurs, including 1987, within Section 18 of the New Lands Permit Area, and until subsidence impacts have been stabilized. PMC will flag and determine the exact location of each monitoring station for the survey so the survey can be carried out at the same stations using the same monitoring methods, on a yearly basis.

*UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(KMM)

Existing Environment and Applicant's Proposal

The permit area contains the headwaters of two small perennial streams - Miller and Tie Fork Creeks. The latter includes Gentry Hollow and Wild Cattle Hollow Forks. There is currently no mining or surface facilities within 100 feet of these streams but mining is planned in Section 18 beneath the NFRF Miller Creek. Aquatic resource studies (pages 783-115 to 123) indicate no degradation to water quality or quantity from the applicant's operations. Subsidence cracks are the only surface disturbances in the Miller Creek drainage area and these are limited to the ridge (page 783-121). Subsidence is not expected to impact Wild Cattle or Gentry Hollow (page 783-122), but may impact NFRF Miller Creek (page 784-62a-c) (See also UMC 817.126 discussion).

Mine water discharge from the Mudwater Fan Breakout has changed Mudwater Creek to a perennial stream. The water discharge is subject to an NPDES permit and is monitored regularly to determine impacts on water quality (page 784-146).

The Corner Canyon Fan Breakout is the only facility in proximity to an intermittent channel. The breakout was constructed so as not to impact the stream and the site has been posted for a stream buffer area (page 784-147).

Compliance

In discussions found on pages 783-122, 784-62b-c, mitigation measures are discussed regarding the possible repair of cracks in the stream channel of the NFRF Miller Creek. The applicant suggests the following mitigation measures will be tried.

1. Seal the cracks in the stream channel with bentonite or other environmentally safe materials;
2. If cracks are too large, rags or some material, will be hand placed in them at a depth of approximately two feet to provide a stop point for bentonite pellets;
3. Concrete or epoxy mixtures;
4. Surface stabilization accomplished by hand tools.

All these methods will be accomplished by diverting flow with culverts, flexible fabric tubing, or plastic liners. These methods will be carried out until the ground stabilizes (page 784-62b & c). Of the methods mentioned, Method #2, the use of rags or other materials to fill large cracks, does not appear to be a permanent environmentally sound method, and therefore is not recommended. Methods 1, 3, and 4 may involve transportation of large amounts of materials into a very remote area (i.e., grout, bentonite, epoxy, etc.), but appears to be common engineering practice. The Division considers foot travel or helicopter the only acceptable means of transportation suggested by the applicant due to the remote steep canyon environment.

In regards to diversion of the stream during implementation of any of these methods, a detailed assessment of flow regimes in the NFRF Miller Creek will be required. Data will be collected at the monitoring station set up at Station M-8 per the requirements spelled out under Stipulation #2, UMC 817.52, to help define flow regimes. The applicant will be required to provide details regarding the use of cutoff walls, etc., upstream of the diversion to enable the flow to enter the culvert (flexible tubing or plastic liner). The applicant will have to maintain this diversion until such time as the subsidence stabilizes and the stream is restored.

Since it is impossible to predict what exactly will occur, Plateau will be required to notify the Division immediately upon discovery of a subsidence crack or potential problem, and have the appropriate mitigation measure to restore the integrity of the NFRF Miller Creek in place within seven (7) days of discovery.

The applicant will be in compliance when the following stipulations are met.

Stipulation UMC 817.57-(2)-(TM)

1. Plateau Mining Company will amend the PAP by October 31, 1987 to commit to notify the Division immediately upon discovery of a crack or surface related impact to the NFRF Miller Creek. PMC will undertake the most appropriate approved mitigation plan to restore the integrity and flow of the NFRF Miller Creek channel and have this measure in place within seven (7) days of discovery of a crack or subsidence related impact.
2. Plateau Mining Company shall provide by October 31, 1987, for insertion into the PAP, design detail for the cutoff walls to be used in the event of a temporary diversion of North Fork of the Right Fork of Miller Creek.

*UMC 817.59 Coal Recovery-(PGL)

Existing Environment and Applicant's Proposal

The operator has committed to maximum coal recovery while using the best technology currently available and maintaining environmental integrity through underground coal mining activities. An approved Resource Recovery and Protection Plan is shown in Exhibit 39.

Compliance

The applicant's Resource Recovery and Protection Plan approved March 20, 1981 is valid.

Section 18 (fee land) will be mined in compliance with UMC 817.121-.126, and therefore, meet the requirements of maximizing recovery while maintaining environmental integrity.

The applicant is in compliance with this section.

Stipulations

None

*UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The applicant provides information about subsidence on pages 784-134 through 784-143. Supplementary subsidence information is given on Maps 5, 6, 61, 62 and in Table 89.

Mining will occur in the Hiawatha seam, Third seam and Wattis seam. Coal extraction will occur by longwall methods in the Wattis

and Third seams and by continuous room and pillar methods in the Hiawatha seam (PAP, page 784-3). Multiple seam mining will primarily occur beneath the northern portion of Hoag Ridge (Section 12, T15S, R7E). The operator estimates that maximum subsidence will be 70 percent of extraction height (PAP page 784-136). Accordingly, in Section 12 (three seams) and Section 18 (2 seams) are projected to be mined with cumulative maximum subsidence anticipated to be less than 14 and 10 feet respectively. Maximum subsidence beneath Gentry Ridge, where the Wattis seam is projected to be mined, will be less than 5 feet.

Overburden thicknesses range from 700 to 1500 feet in the northern portion of Hoag Ridge (includes Section 12) and 1000 to 1700 feet in the Gentry Ridge area. The operator gives a value of 22 1/2 degrees for the angle-of-draw within and adjacent to the permit area (PAP, 784-136). Map 61 locates subsidence-induced tension cracks that have developed over previously mined areas above Star Point.

The applicant proposes to conduct single and double-seam mining beneath the NFRF Miller Creek, a perennial stream (maps 5 and 6). The applicant commits to restricting single- and double-seam mining to areas where overburden exceeds 400 and 480 feet, respectively. Two risk areas labelled "A" and "B" (Figure 1, Exhibit 30) have been identified for development of surface tension cracks.

The applicant identifies renewable resource lands above areas of current and projected mining. The applicant concludes, on the basis of mining methods, stratigraphy and overburden thickness that surface manifestations of subsidence (tension cracking, catastrophic failure) and impacts to renewable resource lands (springs, livestock grazing) will be minimal. However, where subsidence causes tension cracks that are hazardous to livestock or wildlife, the applicant commits to restoring the land surface. Where tension cracks preclude grazing or result in injured or killed livestock, the applicant commits to compensating owners at fair market value for losses.

Ground-water resources (springs) that are materially damaged by mining-induced subsidence will be rehabilitated or mitigated (PAP, pages 817-22 and 817-23). The applicant presents a plan for sealing tension cracks that may potentially form and divert flow within the channel of NFRF Miller Creek (PAP, page 784-62b). The plan incorporates inserting bentonite pellets, rags, concrete, or epoxy into tension cracks to prevent flow loss. The applicant recognizes that mining past outcropping Castlegate Sandstone in Section 18 may cause cliff failure (PAP, page 783-113).

The operator identifies three structures (powerline, cabin, TV towers) that occur above areas that were mined prior to 1977 (Map 1,

Sheet 2) and therefore, are considered to be located above areas that have stabilized. The operator does not anticipate subsidence-induced damage to these structures and does not propose specific mitigation plans.

The operator proposes to monitor vertical and horizontal ground movement by photogrammetric methods, surveying of monuments and visual observations during surface traverses. Photogrammetry will be the primary method for quantifying ground movement. Surface monument surveys will be utilized to determine the resolution of photogrammetric methods. Maps 61, 61A, and 61C show the subsidence monitoring points above longwall panels. Maximum measured subsidence, to date, is two feet (Map 61). The operator commits to conducting an annual field survey (surface traverse) and indicates that monument surveying will be conducted on an irregular basis and eventually phased out (PAP, p. 784-141). Results of surveys will be submitted to the Division on an annual basis (PAP, page 784-142). Surface owners will be notified of the mining schedule according to UMC 817.122.

Compliance

The applicant has provided information about mining methods and locations, overburden thickness and lithology, vertical movement, renewable resource lands and structures.

The applicant has provided a subsidence monitoring plan that identifies monitoring stations and describes schedules for collecting and submitting quantitative data. The subsidence monitoring plan does not incorporate deriving vertical and horizontal movement data from stations located along NFRF Miller Creek. The proposed subsidence monitoring plan does not comply with the requirements of UMC 817.121.

The applicant commits to notifying surface owners according to UMC 817.122.

Maximum subsidence of up to 14 feet is projected for areas of Hoag Ridge where approximately eight springs occur. In addition, approximately 43 springs occur above portions of Gentry Ridge and section 18, where maximum subsidence is projected to be less than five and ten feet respectively. The applicant cannot exclude the possibility of subsidence-induced material damage that results in the reduction of reasonably foreseeable use of surface lands. Although the applicant has provided mitigation plans for loss of grazing habitat and springs, the PAP lacks a plan for evaluating impacts and rehabilitating or restoring vegetation that is impacted by cliff failure. The applicant has also provided a plan that is evaluated under UMC 817.57 for mitigating material damage to NFRF Miller Creek. In summary, the applicant has not provided adequate plans to completely address the requirements of UMC 817.124.

The applicant has integrated site-specific subsurface data with information from elsewhere (New Mexico, Europe) to derive a plan for mining beneath NFRF Miller Creek and identify potential subsidence-induced material damage to the perennial stream (Exhibit 30). The Division concurs with the applicant's assessment of the risk for development of material damage (tension cracking) at localities A and B. Further technical review revealed that premises used to predict rock failure are based on tenuous geologic and topographic analogies, and therefore, are considered of limited applicability to the Wasatch Plateau Coal Field or Section 18. Hence, derived overburden thicknesses (400 and 480 feet) do not substantiate that proposed development will prevent subsidence-induced material damage to NFRF Miller Creek. The applicant's proposal for longwall development beneath NFRF Miller Creek does not comply with the requirements of UMC 817.126.

The applicant will be in compliance with this section when the following stipulations are met.

Stipulation UMC 817.121-(1)-(RVS)

1. Plateau Mining Company will provide, by August 31, 1987, a subsidence plan for monitoring vertical and horizontal movement along NFRF Miller Creek.

Stipulation UMC 817.124-(1)-(KMM)

1. Plateau Mining Company will, by October 31, 1987, commit to providing in the Annual Subsidence Report:
 - (A) an assessment of the impacts of cliff failure and resulting talus slope formation on vegetation and wildlife resources.
 - (B) An acceptable vegetation/mitigation plan to be implemented in the first normal season after significant subsidence and cliff failure ceases.

Stipulation UMC 817.126-(2)-(RVS)

1. Plateau Mining Company will, by October 31, 1987, commit to restricting longwall mining in panel three (Section 18) of the Wattis seam to areas of 500 or more feet of overburden. Moreover, in areas of 400 to 500 feet of overburden in Panel three (Section 18), the applicant will commit to mining by the room and pillar method with retention of pillars that are properly sized to maintain the integrity of NFRF Miller Creek.

2. Longwall mining and development in Panels 7 and 8 (Section 18, third panel), may not proceed until:

- (A) PMC has identified, to the Division's satisfaction, subsidence-induced material damage associated with Wattis seam mining, and
- (B) the Division has evaluated potential environmental degradation.

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